

2. The existence of considerable differences of potential between two contacts upon the outer surface of the skin, and the fact that such E.M.F. is capable of excitatory augmentation upon mechanical stimulation, coincides with the assumption that the E.M.F. of the current of rest is the outcome of glandular processes of variable activity and is not compatible with the theory of origin of the E.M.F. in mucin-metamorphosis.

3. The reductions in the E.M.F. of the normal rest current following exposure of the skin to carbonic acid gas and to the vapour of chloroform, and the subsequent recovery upon admission of air, are strong evidence that the origin of the E.M.F. is in some active vital processes taking place in the skin, and it is reasonable to assume that these occur in its secretory elements.

4. The demonstration that the E.M.F. of the skin of the Eel undergoes an excitatory variation as a result of electrical, thermic, and mechanical stimulation, is in accordance with what is known to occur in other glandular structures, and the fact that such excitatory change manifests itself as a positive variation of the current of rest agrees in the main with the phenomena observed in other cases.

5. The fact that chloroform narcosis excludes the possibility of the excitatory variation upon stimulation, at the same time as it reduces the E.M.F. of the normal rest current to zero, supports the assumption that the E.M.F. of the current of rest and that of the current of action originate in one and the same source.

6. Finally, the reduction of the E.M.F. of the normally directed current of rest by atropinisation and the complete absence of any excitatory variation under such conditions, are facts strongly in favour of the hypothesis that both the E.M.F. of the current of rest and that of the current of action are from a glandular source.

IV. "Preliminary Note on the Relation of the Ungual Corium to the Periosteum of the Ungual Phalanx." By F. A. DIXEY, M.A., M.D., Fellow of Wadham College, Oxford. Communicated by E. A. SCHÄFER, F.R.S. Received November 22, 1892.

The corium underlying the epithelium of the developing nail in the human embryo is at an early age distinguishable from the cutis vera of the remainder of the digit by its greater thickness and density. Opposite the groove across the dorsal surface of the digit, which represents the anterior border of the growing nail, the thick firm connective tissue layer constituting the ungual corium does not thin out or pass into the general corium; but, still preserving its original thickness, it sinks deeply into the substance of the digit, and travers-

ing the loose subcutaneous tissue in the form of a well-defined curved band, with the convexity generally directed forwards, it reaches and becomes continuous with the periosteum surrounding the distal extremity of the ungual phalanx. These two structures, viz., the ungual corium and the periosteum of the ungual phalanx, which are histologically very similar to one another, and distinct from the connective tissue forming the bulk of the terminal segment of the digit, are thus placed in complete continuity by means of the curved band of dense connective tissue above described.

V. "Experiments on the Action of Light on *Bacillus anthracis*."

By H. MARSHALL WARD, F.R.S., Professor of Botany, Royal Indian Engineering College. Received December 15, 1892.

It is abundantly evinced by experiments that direct insolation in some way leads to the destruction of spores of *Bacillus anthracis*, and in so far the results merely confirm what had already been discovered by Downes and Blunt in 1877 and 1878.\*

From the fact that an apparent retardation of the development of the colonies on plates exposed to light was observed several times under circumstances which suggested a direct inhibitory action of even ordinary day-light, the author went further into this particular question with results as startling as they are important, for if the explanation given of the phenomena observed in the following experiments turns out to be the correct one, we stand face to face with the fact that by far the most potent factor in the purification of the air and rivers of bacteria is the sun-light. The fact that direct sun-light is efficacious as a bactericide has been long suspected, but put forward very vaguely in most cases.

Starting from the observation that a test-tube, or small flask, containing a few c.c. of Thames water with many hundreds of thousands of anthrax spores in it may be entirely rid of living spores by continued exposure daily for a few days to the light of the sun, and that even a few weeks of bright summer day-light—not direct insolation—reduces the number of spores capable of development on gelatine, it seemed worth while to try the effect of direct insolation on plate-cultures, to see if the results could be got more quickly and definitely.†

Preliminary trials with gelatine plate-cultures at the end of the

\* See p. 237 of "First Report to the Water Research Committee of the Royal Society" ('Roy. Soc. Proc.,' vol. 51, 1892) for the literature on this subject up to 1891.

† It appears that Buchner ('Centr. f. Bakt.,' vol. 12, 1892) has already done this for typhoid, and finds the direct rays of the summer sun quite effective.